

REMARKS

This is a full and timely response to the Office Action dated April 8, 2011.

Present Status of the Application

The abstract of the disclosure is objected to as including the phrases "comprises" and the typo "a code stream.."

Claims 1-4 and 7-10 are rejected under 35 U.S.C. 101 because the claimed invention includes ineligible embodiments in the specification.

Claims 1, 2, 7, 8 and 10 are rejected under 35 U.S.C. 102(e) as being assertedly anticipated by Srinivasan et al. (US 2003/0113026; hereinafter "Srinivasan").

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being assertedly unpatentable over Srinivasan in view of Hatano et al. (US 6,792,046; hereinafter "Hatano").

Claims 9 is rejected under 35 U.S.C. 103(a) as being assertedly unpatentable over Srinivasan in view of Hagai et al. (US 2004/0146105; hereinafter "Hagai").

After carefully considering the Office Action and the cited references, Applicants have amended claims 1-4 and 8-10, have canceled claim 7, and have amended the abstract to overcome all the objection and rejections on the following basis. The amendment is supported by paragraphs [0002] (the first paragraph of the "Background of the Invention" section) and [0024] (the third paragraph of the "Detailed Description of the Preferred Embodiments" section) of the originally filed specification, and Applicants respectfully submit that no new matter has been entered by way of amendment. Upon entry of the above amendment, Applicants submit that all the pending claims

1-4 and 8-10 are in proper condition for allowance. Withdrawal of all the objection and rejections and allowance of all the pending claims are earnestly requested.

Response to Objection to the Abstract

The abstract of the disclosure is objected to as including the phrases "comprises" and the typo "a code stream.."

In response thereto, Applicants have corrected the abstract according to the suggestions in the Office Action.

Response to Claim Rejections under 35 U.S.C 101

Claims 1-4 and 7-10 are rejected under 35 U.S.C. 101 because the claimed invention includes ineligible embodiments in the specification.

In response thereto, Applicants have amended the preamble of the claims as to state: "encoding method used by a digital television, a mobile communication apparatus, a broadband communications network apparatus or a family consumer electronics apparatus for skipped macroblocks in a video image of a video processing system," so as to tie the claimed method to another statutory category of subject matter under 35 U.S.C. 101.

As known to those of ordinary skill in the art, a good video encoding/decoding method implemented by a video processing system can improve the video processing efficiency of the video processing system, especially in a video processing hardware device such as a digital television or a consumer electronics apparatus. Also, in the first paragraph of the "Background of

the Invention" section of the originally filed specification, it is stated that a digital television, new generation mobile communications, broadband communications network and family consumer electronics focus on multimedia of which the main content is video and audio processing technology. Thus no new matter has been introduced by this amendment.

Response to Claim Rejections under 35 U.S.C 102

Claims 1, 2, 7, 8 and 10 are rejected under 35 U.S.C. 102(e) as being assertedly anticipated by Srinivasan.

In response thereto, Applicants have amended claims 1 and 10 and have canceled claim 7, so as to respectfully traverse said rejections on the following grounds.

Applicants submit that the following technical features of claim 1 are not disclosed by Srinivasan:

"selecting a run_length coding mode or a joint coding mode of the number of skipped macroblocks and the macroblock types for a macroblock type in the current image according to the number of skipped macroblocks, wherein the run_length coding mode is employed for the current image with a plurality of skipped macroblock, and the joint coding mode is employed for the current image with few skipped macroblocks, wherein the run_length coding mode is to employ a variable_length coding to encode the number of skipped macroblocks for continuous skipped macroblocks; and add one indication bit between continuous non-skipped macroblocks to indicate that the number of skipped macroblocks is 0, if it is the run_length coding mode, then proceeding to step 3; if it is the joint coding mode of the number of skipped macroblocks and the macroblock type, then proceeding to step 4."

The code efficiency is low only by using a single coding mode to encode the skipped

macroblock. Claim 1 of the present invention defines that, according to the number of skipped macroblocks, the encoding method used by some apparatus can select a run_length coding mode or a joint coding mode of the number of skipped macroblocks and the macroblock types for a macroblock type in the current image. That is to say, the encoding method of the present invention can select different encoding modes for skipped macroblocks according to the number of skipped macroblocks, so as to improve the encoding efficiency. In some flat sequences, there are many skipped macroblocks, and a run_length coding mode can be selected, which employs a variable_length coding to encode the number of skipped macroblocks for continuous skipped macroblocks. As known to those of ordinary skill in the art, in the variable_length coding, shorter codes are assigned to more probable coding, and longer codes are assigned to less probable coding, so the variable_length coding can save bits, and the code efficiency is improved. In some sequences with big motion, there are fewer skipped macroblocks, the number of continuously appeared skipped macroblocks is also smaller, and the frequently appeared smaller numeral values are unfavorable to the variable_length code for encoding, so a joint coding mode of the number of skipped macroblocks and the macroblock types for a macroblock type in the current image can be selected. Therefore, the present invention can select a coding mode according to the characteristic of video sequence (number of skipped macroblocks) not only in some flat sequences (pictures) but also in some sequences (pictures) with big motion, so as to improve code efficiency.

In contrast, Srinivasan fails to disclose how to select a skip-macroblock coding mode from four coding modes in the first embodiment or from seven coding modes in the second

embodiment, and also fails to disclose what a skip-macroblock coding mode selected by the video encoder is based on. Also, the VLC is used to encode the coding mode for the bit plane, not to encode the number of skipped macroblocks for continuous skipped macroblocks. Therefore, Srinivasan fails to disclose the claimed feature of "selecting a run_length coding mode or a joint coding mode of the number of skipped macroblocks and the macroblock types for a macroblock type in the current image according to the number of skipped macroblocks, wherein the run_length coding mode is employed for the current image with a plurality of skipped macroblock, and the joint coding mode is employed for the current image with few skipped macroblocks."

In another aspect, Srinivasan suggests four coding modes (please see paragraphs [0119] to [0138]) in the first embodiment, but each of them is different from the run_length coding mode in the present invention. For example, Srinivasan teaches encoding each macroblock with a bit in normal mode, adding an indicator bit for one row with all skipped macroblocks in a row-prediction mode, or adding an indicator bit for one column with all skipped macroblocks in a column-prediction mode, which do not employ a variable_length coding to encode the number of skipped macroblocks for continuous skipped macroblocks. However, for the same image frame, the normal mode and the other three coding modes would get a different bitstream from run_length coding in the present invention. In addition, Srinivasan suggests seven coding modes (please see paragraphs [0151] to [0198]) in the second embodiment, whereas in the present invention, each of these would get a different bitstream from the run_length coding mode or the joint coding mode of the number of skipped macroblocks and the macroblock type. Therefore,

the coding mode in the present invention was not disclosed by Srinivasan.

Based on the above two aspects, it can be seen that, Srinivasan fails to disclose the claimed features of "selecting a run_length coding mode or a joint coding mode of the number of skipped macroblocks and the macroblock types for a macroblock type in the current image according to the number of skipped macroblocks, wherein the run_length coding mode is employed for the current image with a plurality of skipped macroblock, and the joint coding mode is employed for the current image with few skipped macroblocks, wherein the run_length coding mode is to employ a variable_length coding to encode the number of skipped macroblocks for continuous skipped macroblocks; and add one indication bit between continuous non-skipped macroblocks to indicate that the number of skipped macroblocks is 0, if it is the run_length coding mode, then proceeding to step 3; if it is the joint coding mode of the number of skipped macroblocks and the macroblock type, then proceeding to step 4." Srinivasan fails to improve the encoding efficiency by selecting a run_length coding mode or a joint coding mode of the number of skipped macroblocks and the macroblock types for a macroblock type in the current image according to the number of skipped macroblocks.

Therefore, claim 1 and claims 2, 7, 8 and 10 dependent therefrom are all patentable over Srinivasan.

Response to Claim Rejections under 35 U.S.C 103

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being assertedly unpatentable over Srinivasan in view of Hatano.

Claims 9 is rejected under 35 U.S.C. 103(a) as being assertedly unpatentable over Srinivasan in view of Hagai.

In response thereto, Applicants have amended claim 1, so as to respectfully traverse said rejections on the following grounds.

As elaborated above, currently amended claim 1 contains the following features that are not disclosed by Srinivasan:

"selecting a run_length coding mode or a joint coding mode of the number of skipped macroblocks and the macroblock types for a macroblock type in the current image according to the number of skipped macroblocks, wherein the run_length coding mode is employed for the current image with a plurality of skipped macroblock, and the joint coding mode is employed for the current image with few skipped macroblocks, wherein the run_length coding mode is to employ a variable_length coding to encode the number of skipped macroblocks for continuous skipped macroblocks; and add one indication bit between continuous non-skipped macroblocks to indicate that the number of skipped macroblocks is 0, if it is the run_length coding mode, then proceeding to step 3; if it is the joint coding mode of the number of skipped macroblocks and the macroblock type, then proceeding to step 4."

It is submitted that these features are not disclosed by Hatano or Hagai either, so that claim 1 and claims 3, 4 and 9 dependent therefrom are patentable over Srinivasan, Hatano and Hagai, whether taken alone or in any combination.

In addition, notwithstanding the fact that claim 3 is patentable due to its dependency from

claim 1, claim 3 is also patentable due to the following reasons.

Hatano suggests a rate control unit 102 which selects a variable length coder 5a or fixed code 104 according to Tmax, but Tmax is the upper limit of the number of bits for the VOP, so as to prevent the transmission buffer 103 from overflowing VBV buffer from underflowing (please see Column 9). In claim 3, however, an optimal coding mode is selected for the slipped macroblocks in the current image through a twice encoding procedure, so as to improve encoding efficiency. Therefore, the encoding procedure by Hatano is different from the twice encoding procedure in claim 3.

CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-4 and 8-10 of the present application patently define over the cited art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,
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